



INVESTOR IN PEOPLE

The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

REC'D 17 NOV 2003

WIPO PCT

## PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

Dated

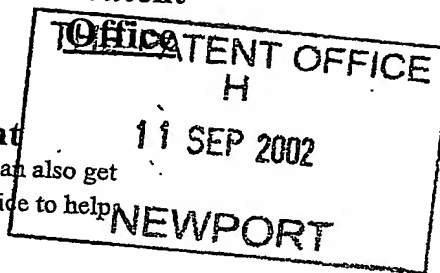
20 October 2003

**BEST AVAILABLE COPY**

Patents Act 1977  
(Rules 16)

**Request for grant of a patent**

(see notes on the back of this form. You can also get  
an explanatory leaflet from the Patent Office to help  
you fill in this form)



11SEP02 E747360-1 D00115  
The Patent Office

Cardiff Road  
Newport  
Gwent NP10 8QQ

1. Your reference

A2687

2. Patent application number

(the Patent Office will fill in this part)

0221018.5

11 SEP 2002

3. Full name, address and postcode of the or of  
each applicant (underline all surnames)

Automotive Products Italia (SV) S.p.A.  
Corso Marconi 160  
17014 Cairo Montenotte  
Savona  
Italy

Patents ADP number (*if you know it*)  
If the applicant is a corporate body, give the  
country/state of its incorporation

8139974001  
Italy

4. Title of the invention

PARKING BRAKES

5. Name of your agent (*if you have one*)

R Morrall

"Address for service" in the United Kingdom  
to which all correspondence should be sent

(including the postcode)

Automotive Products Group Ltd  
Patent Department  
PO Box 2085  
Tachbrook Road  
Leamington Spa  
Warwickshire  
CV31 3ZL

Patents ADP number (*if you know it*)

7819303002

6. If you are declaring priority from one or more  
earlier patent applications, give the country  
and the date of filing of the or of each of these  
earlier applications (*if you know it*) the or  
each application number

Country	Priority application number ( <i>if you know it</i> )	Date of filing ( <i>day/month/year</i> )
---------	--	---

7. If this application is divided or otherwise  
derived from an earlier UK application

Number of earlier application

Date of filing  
(*day/month/year*)

8. Is a statement of inventorship and of right  
to grant of a patent required in support of  
this request? (*Answer 'Yes' if:*

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body:
- See note (d)

YES

BEST AVAILABLE COPY

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 4 ✓

Claim(s) 1 ✓

Abstract ✓

Drawings 2 + 2 *drawings*

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

YES ✓

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(*please specify*)

11. I/We request the grant of a patent on the basis of this application  
Signature *R. Morrall* Date *10/9/02*

R Morrall - Agent

12. Name and daytime telephone number of person to contact in the United Kingdom  
**R Morrall 01926 473178**

**Warning**

*After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.*

**Notes**

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- d) If you have answered 'Yes' Patent Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

Patents Form 1/77

**BEST AVAILABLE COPY**

A2687GB

## PARKING BRAKES

This invention relates to parking brakes and in particular to parking brakes hereinafter referred to as of the type described which comprise a drum containing a pair of brake shoes, a handbrake lever pivoted adjacent one end on one of the shoes, and a strut extending between a first abutment on the handbrake lever and a second abutment on the other brake shoe so that pivoting of the handbrake lever relative to said one shoe moves the strut which in turn moves the other shoe away from said one shoe to bring the shoes into contact with the drum and thus apply the parking brake.

Parking brakes of the type described are well known and work efficiently particularly when they are actuated manually by a conventional driver operated lever. There is, however, an increasing requirement to provide parking brakes which are capable of electric motor application in order to dispense with the conventional manually operated lever.

One problem associated with electric motor actuated parking brakes is that the actuation system often has a relatively limited movement capability and this can therefore provide difficulties in ensuring efficient and sufficiently long lived actuation of the parking brake function when teamed with a parking brake of the type described which includes significant inherent lost motion in its actuation linkage.

It is an object of the present invention to provide an improved form of parking brake of the type described which at least reduces the above difficulty.

Thus in accordance with the present invention there is provided a parking brake of the type described in which a biased wedging means acts between the strut and one of the first or second abutments to take up all play in the thrust path between the handbrake lever and the other brake shoe via the strut.

BEST AVAILABLE COPY

Such an arrangement can significantly reduce the lost motion in the parking brake actuating linkage due to manufacturing and assembly occurrences between the strut and the first and second abutments and can also compensate for periodic wear (due, for example, to Brinelling) of these components resulting from the high loads imposed on these components.

Preferably the second abutment comprises a plate secured to the web of the other shoe and having a surface along which an edge of the biased wedge can slide, a further edge of the wedge sliding along a further abutment surface on the strut. Preferably the further abutment surface on the strut comprises the root of a forked end portion of the strut, the forked end having two prongs which extend on opposite sides of a web of the other brake shoe.

The ends of the brake shoes remote from the strut may pivot on a fixed reaction abutment or on a manual or automatic wear adjustment device positioned between the ends of the shoes. For example the automatic wear adjustment device for a parking brake described in the Applicant's co-pending application..... (Applicant's reference A2688) is particularly suitable.

One embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 shows a side view of a parking brake in accordance with the present invention;

Figure 2 shows on a larger scale the biased wedging arrangement used in the parking brake of Figure 1, and

Figure 3 shows diagrammatically further details of the biased wedging arrangement.

Referring to the drawings this shows a parking brake 10 for use in a so-called drum in disc brake in which a pair of shoes 11 and 12 are mounted on a backplate 13 with one end of the shoes being pulled against a fixed backplate mounted abutment 14 by return spring 15 and the other end of the shoes pivoting on a wear adjustment device which is shown diagrammatically

at 16 in figure 1. This wear adjustment device may be manually adjusted or automatically adjusted as for example disclosed in the automatic parking brake adjustment device disclosed in the Applicant's co-pending patent application number ..... (A2688) referred to above.

The shoes are contained within a drum indicated diagrammatically at 17 in figure 1 and the shoes are arranged to be brought into contact with the drum 17 by an actuating mechanism which comprises a handbrake lever 18 which is pivoted adjacent one end by pin 19 on brake shoe 11. A strut 20 which has forked ends 20a and 20b acts between a first abutment 18a on handbrake lever 18 and a second abutment associated with brake shoe 12 in the form of a plate 22 which is riveted to the shoe 12 at 23 and 24. A biased wedge 21 acts between the root 20c of forked end 20b and a plate 22.

The biased wedge 21 has one edge 21a which slides down an edge 22a of plate 22 and a further edge 21b which contacts the root 20c of forked end 20b of strut 20. The wedge 21 is biased between the surface 22a and the root 20c by a wire spring 23 which encircles rivet 24 and has one end 23a engaging a slot 24 in wedge 21 and the other end 25 bearing against the inside of the table 12a of brake shoe 12.

Thus, as will be appreciated, any manufacturing or assembling clearances which may be present between the abutment surface 18a on handbrake lever 18 and the co-operating root 20d of forked end 20a of strut 20 and between the root 20c and the biased wedge 21 are automatically taken up due to the biasing effect of the wire spring 23 so that there is no lost motion in the parking brake actuating mechanism. Thus all pivoting of the handbrake lever 18 relative to the brake shoe 11 by, for example, a cable 26 which is attached to the lower end 18c of handbrake lever results in immediate movement of the strut 20 and the other brake shoe 12. Also any changes in the size of these contacting components during use of the brake (e.g. caused by Brinnelling due to the high loads imposed) will be taken-up by the biased wedge 21.

**BEST AVAILABLE COPY**

As will be appreciated if the cable 26 is operated by an electric motor it is particularly important that all lost motion in the actuating mechanism should be eliminated and this is efficiently and cheaply carried out by the biased wedge 21. It will also be noted that clearances between the strut 20, lever 18 and shoe 12 are multiplied by a factor of approximately 5 at the lower end 18c of lever 18 due to the lever ratio thus making their elimination even more important.

The cable 26 can be attached to the lower end 18c of handbrake lever 18 by any suitable arrangement. For example the pivoting latch arrangement disclosed in the Applicant's co-pending PCT application number WO98/40640.

As indicated above the wear adjustment device 16 (which adjusts the position of the brake shoes in order to compensate for the wear of the brake linings 11b and 12b of the shoes respectively) may either be a conventional screw-threaded manual adjustment device which is operated through a hole in the backplate of the brake or could be an automatic adjustment device as, for example, described in the Applicant's co-pending application number ..... (A2688). Since this wear adjustment device forms no part of the present invention it will not therefore be described in detail and if details of a suitable adjustment device are required reference should be made to the above referred to co-pending patent application.

## CLAIMS

1. A parking brake of the type described in which a biased wedging means acts between the strut and one of the first or second abutments to take up all play in the thrust path between the handbrake lever and the other brake shoe via the strut.
2. A parking brake according to claim 1 in which the second abutment comprises a plate secured to the web of the other shoe and having a surface along which an edge of the biased wedge can slide, a further edge of the wedge sliding along a further abutment surface on the strut.
3. A parking brake according to claim 2 in which the further abutment surface on the strut comprises the root of a forked end portion of the strut, the forked end having two prongs which extend on opposite sides of a web of the other brake shoe.
4. A parking brake according to any one of claims 1 to 3 in which the ends of the brake shoes remote from the strut pivot on a fixed reaction abutment or on a manual or automatic wear adjustment device positioned between the ends of the shoes.
5. A parking brake of the type described constructed and arranged substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

**BEST AVAILABLE COPY**



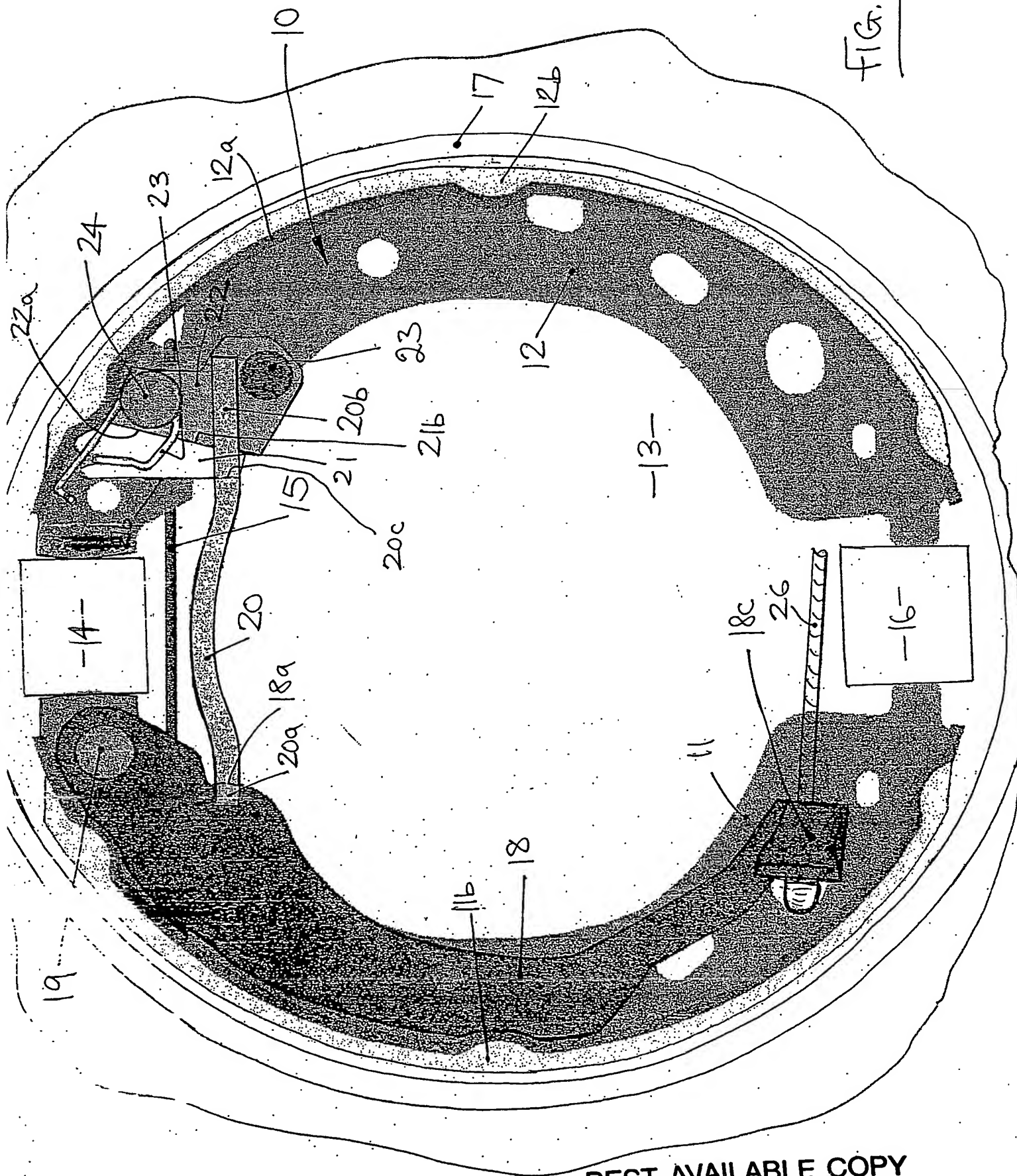
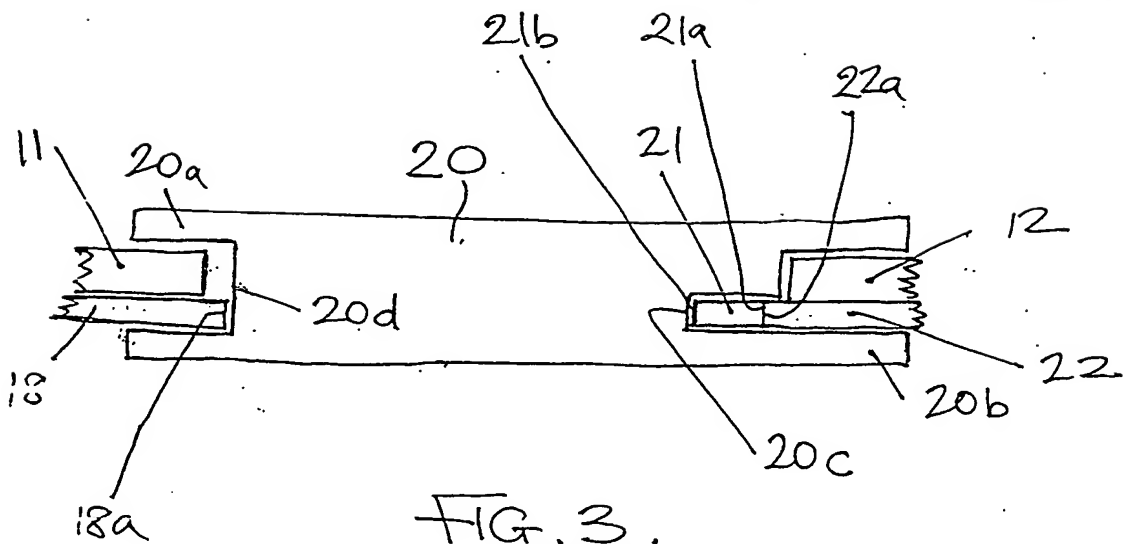
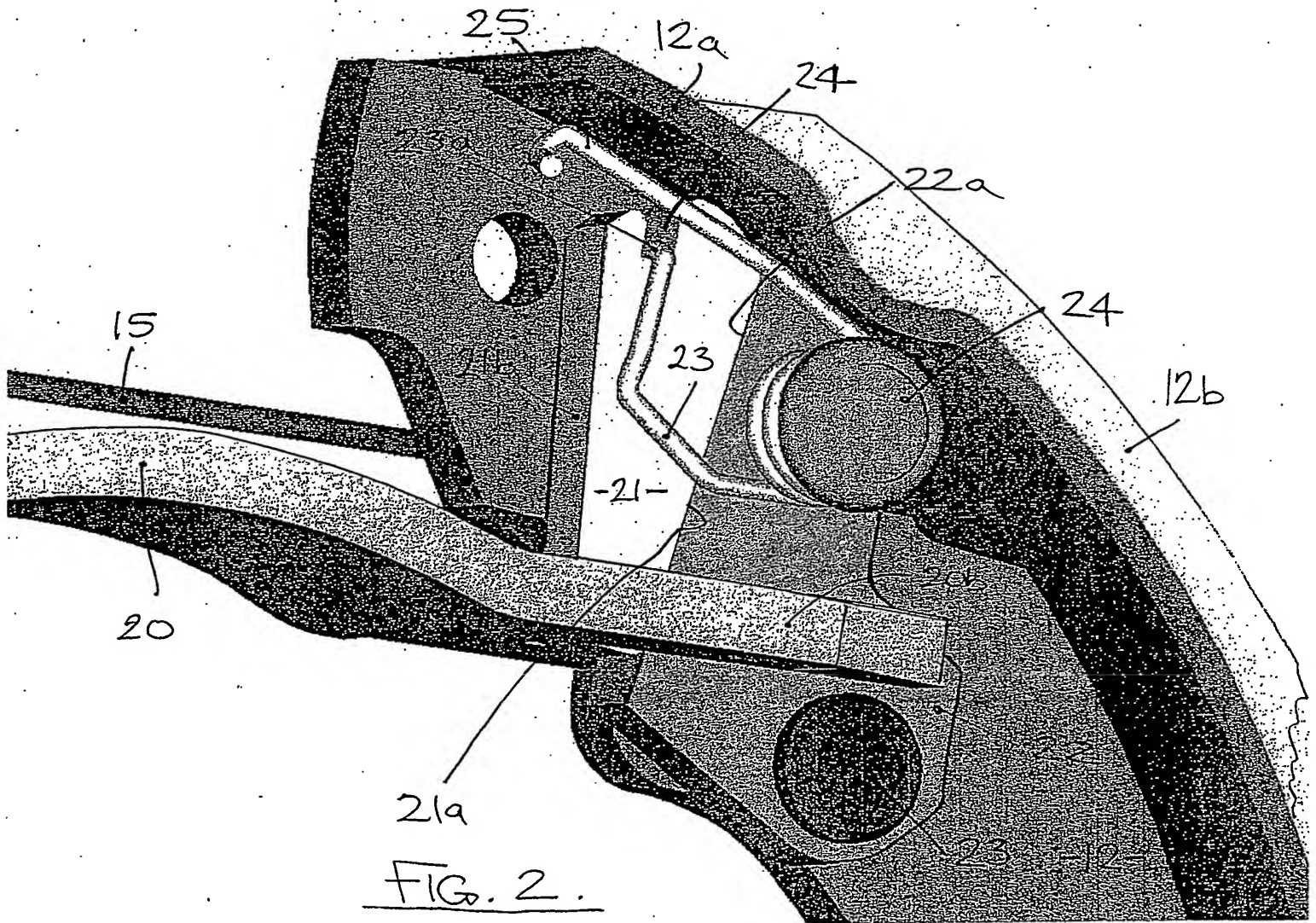


FIG. 1.



BEST AVAILABLE COPY